



## **Summer 2022 Internships in Assessment Science and Psychometrics June 6 - July 29, 2022**

**This year's internship is planned to be in-person in Philadelphia, PA. However, this may change to a fully virtual internship due to uncertainty surrounding the Covid-19 pandemic.**

Interns will interact with other graduate students and NBME staff and will present completed projects or work-in-progress to NBME staff. The expected deliverables from the summer internship project are an internal research presentation, as well as a conference submission / presentation (AERA, NCME, AAMC, etc) and/or a paper submitted for publication.

### **Requirements**

- ▶ **Active enrollment in doctoral program in measurement, statistics, computer science, cognitive science, medical education, or related field; completion of two or more years of graduate coursework.**
- ▶ **Experience or coursework in one or more of the following: test development, IRT, CTT, statistics, research design, and cognitive science. Advanced knowledge of topics such as equating, generalizability theory, or Bayesian methodology is helpful. Skill in writing and presenting research. Working knowledge of statistical software (e.g., Winsteps, BILOG; SPSS, SAS, Python, or R).**
- ▶ **Interns will be assigned to one or more mentors but must be able to work independently.**
- ▶ **Must be authorized to work in the US for any employer. If selected, F-1 holders will need to apply for Curricular Practical Training authorization through their school's international student office and have a social security number for payroll purposes.**

### **Compensation**

Total compensation for the two months is approximately \$10,000. \$2,000 will be provided before the start of the internship to help secure housing in the area, with the other \$8,000 disbursed in accordance with time worked.

### **Research Projects**

Interns will help define a research problem; review related studies; conduct data analyses (real and/or simulated data); and write a summary report suitable for presentation. Projects are summarized below. Applicants should identify 2 projects by number that they prefer to work on.

- 1. Evaluating Secondary Score Uses.** The first exam in the medical licensure exam sequence, the United States Medical Examination (USMLE) Step 1 exam, recently transitioned from reporting a three-digit score to only reporting pass/fail outcomes starting in January 2022. Given this change, there may be changes to the secondary uses of the scores from the second exam in the medical licensure exam sequence, Step 2 Clinical Knowledge (CK). For this project, the intern will evaluate potential changes in secondary uses of Step 2 CK scores through survey and test administration data prior to and after the change in Step 1 score reporting.

- 2. Predictive Validity of Licensure Exam Performance.** This project investigates relationships between USMLE-based educational measures and indicators of the subsequent performance of physicians using hospital quality of care indicators. The research will be focused on assessing the role of skills and competencies tested by the USMLE for the success of practicing physicians. We will be collecting and analyzing validity arguments for the integral USMLE components (medical knowledge and understanding of clinical science, patient-centered clinical skills) using exam performance data, patient data, and physician data. A range of psychometric models can be engaged for this research including a variety of exploratory data analysis techniques, generalized linear models, IRT, latent class models, cognitive diagnostic models, classification consistency, and others.
- 3. Scoring of Complex Item Types.** The measurement of complex mental processes or competencies often requires the use of item types that are different than standard MCQ items or dichotomously-scored free text response items. NBME has started a research program investigating the feasibility for new non-MCQ item types to reliably and validly measure aspects of clinical reasoning. The intern for this project will help explore scoring methods for these complex item types, which may include the use of NLP to score free-response text items.
- 4. AI Item Analysis.** NBME is currently engaged in research focused on the ultimate goal of developing a fully automated simulation system that allows medical students to interact with virtual patients. The system will provide a platform through which students can practice clinical and diagnostic skills and will support the provision of formative feedback. We are seeking the support of an intern who will work with the principal investigators to analyze data from an initial pilot to determine whether the current NLP- and AI-based technology can provide a seamless and realistic physician-patient interaction. Both qualitative and quantitative methods are expected to be used in the analysis.
- 5. Health System Science Competencies and Constructs.** Physician training curricula have traditionally consisted of basic science and clinical science content. Recently, Health Services Science (HSS) has been viewed as a critical content area for training physicians and other health professionals. Objectives for HSS curricula typically focus on knowledge, skill, and behavioral competencies for effective health care delivery, including interprofessional teamwork and health systems improvement. The intern for this project would investigate the competencies and constructs that are covered by the term “Health Systems Science” with a focus on their assessment and the validity of such assessments.

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6. **Using Natural Language Processing for Detecting Clinical Concepts.** Recent advances in Natural Language Processing (NLP) have sparked interest in the problem of interpretable methods for scoring written text. We invite summer interns to explore this problem in the context of clinical text mining, where phrases from examinee-written text need to be mapped to concepts from a scoring rubric. This application has the potential for high practical value since an approach like this can be used for different assessment types, ranging from short-answer questions to more elaborate forms of free response.
  
7. **Interactive Psychometric Dashboards.** Contemporary methods of communicating score information are evolving beyond fixed displays on traditional 8 ½ by 11-inch page layouts. Additionally, score users demand more flexibility and specificity to draw tailored inferences in support of evidence-based decisions. For this project the intern will contribute to the development of dashboard products using R Shiny and participate in engagement efforts with internal and external customers.

## Application

Candidates may apply by going to <https://nbme.applicantpro.com/jobs/>. A cover letter outlining experience and listing *project interests by number*, along with a current resume, are required. Application deadline is **January 31, 2022**.

All applicants will be notified of selection decisions by **February 25, 2022**.

## About NBME – Complete

NBME offers a versatile selection of high-quality assessments and educational services for students, professionals, educators, regulators and institutions dedicated to the evolving needs of medical education and health care. To ensure our assessments meet the highest standards of quality, stay relevant and align to the current curriculum in medical schools and training programs, we rely on a wide network of collaborators. These include the volunteers who help develop our exam questions, the committees and panels who represent various groups within the medical education community, external researchers and health profession organizations.

We are committed to meeting the needs of educators and learners globally with assessment products and expert services such as NBME® [Subject Examinations](#), [Customized Assessment Services](#), [Self-Assessments](#), the [International Foundations of Medicine® Program](#) and [Item Writing Workshops](#). Together with the Federation of State Medical Boards, NBME develops and manages the [United States Medical Licensing Examination®](#), which measures the ability to apply knowledge and skills that form the basis of safe and effective patient care. Our Competency-based Assessment unit is focused on new methods as well as the optimization of assessment in the workplace and education.

As a result of leadership in ongoing research, innovative measurement practices and the exploration of forward-thinking assessment modalities and improvements, NBME advances assessment science. Our grant and funding opportunities further support this dedication to medical education and assessment science. We help develop the next generation of assessment professionals through our [Summer Psychometric Internship Program](#). Through the [Stemmler Fund](#), [Strategic Educators Enhancement Fund](#) and [Latin America Grants Program](#), researchers and educators can continue to improve the assessment of health care professionals around the world.

NBME views diversity, equity and inclusion (DEI) as foundational and enduring to our strategy and vision. We continue to focus on ensuring that our DEI work is impactful and ingrained in everything we do, including with our staff, culture, products and services, the Philadelphia community and the broader medical education landscape. Our commitment manifests in our hiring and staff development, recruitment for committees, grants programs, design and review of our assessments, and involvement in our local and national communities.

Learn more about NBME at [NBME.org](https://www.nbme.org).

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